

ABSTRACT

A hydrodynamically lubricating rotary seal for partitioning a lubricant from an environment has a generally circular seal body, a sloping dynamic sealing lip, and an energizer. The dynamic sealing lip is provided for establishing compressed sealing relation with a relatively rotatable surface, and has a sloping dynamic sealing surface that varies in width, and also has a hydrodynamic inlet curvature that varies in position around the circumference of the seal. When the seal is installed against a relatively rotatable surface, the dynamic sealing lip deforms to define a variable width interfacial contact footprint against the relatively rotatable surface that is wavy on the lubricant side, and wedges a film of lubricating fluid into the interface in response to relative rotation. The environment edge of the interfacial contact footprint is substantially circular, and therefore does not produce a hydrodynamic wedging action in response to relative rotation.